

REMARKS

Claims 1-22 are pending in the application. Claim 1 is amended with this submission. Reconsideration of the application is respectfully requested based on the following remarks.

I. REJECTION OF CLAIMS 1-22 UNDER 35 U.S.C. § 112

Claims 1-22 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Reversal of the rejection is respectfully requested for at least the following reasons.

The Final Office Action states that the claim(s) contain subject matter was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed art.

Specifically the Final Office Action states that claim 1 has been amended to require that the local oscillator signal input receive "the complex-value payload signal at a carrier frequency" and that according to the specification originally filed, what the modulator receives at a carrier at frequency is the output signals from a VCO (5) via a frequency divider (4). In making such argument Final Office Action asserts that these **output signals are not payload signals**.

Claim 1 has been amended as follows: "A signal transmission apparatus, comprising: a quadrature modulator having an in-phase and **quadrature input for receiving a complex-value payload signal**, having a local oscillator signal input for receiving a local oscillator signal at a carrier frequency, and having a signal output for providing a modulated transmission signal..." The claimed subject matter is described in the specification (See, e.g., page 4, lines 2-6; and page 11, lines 6).

As set forth above, the claimed subject matter was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed art. Accordingly, a reversal of the rejection is respectfully requested.

II. REJECTION OF CLAIMS 1-5, 14-17 and 22 UNDER 35 U.S.C. § 103(a)

Claims 1-5, 14-17 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Walczak *et al.* (U.S. Patent 5,193,223) in view of Franchville *et al.* (U.S. Patent 6,041,076) and Ichihara (U.S. Patent 6,587,513). Reversal of the rejection is respectfully requested for at least the following reasons.

i. Neither Walczak et al. nor Franchville et al. nor Ichihara teach undersampling the modulated transmission signal with respect to the carrier frequency, as recited in amended independent claim 1.

Walczak *et al.* are silent with respect to *undersampling the modulated transmission signal with respect to the carrier frequency* as recited in claim 1, as the examiner correctly asserts in the Final Office Action dated July 5, 2007. (See page 4, lines 5-7).

Moreover, the secondary document, Franchville *et al.* does not cure the aforementioned deficiency with respect to the Walczak *et al.* reference.

The Final office Action dated July 7, 2007 asserts that Franchville *et al.* teach "that undersampling having a sampling rate below the required Nyquist rate reduces processing speed requirements including that of the A/D converter." (See *e.g.*, page 4, lines 7-9). However, Franchville *et al.* do not teach undersampling the modulated transmission signal with respect to the carrier frequency.

As stated in the specification, the claim 1 language "undersampling the modulated transmission signal with respect to the carrier frequency" ensures side band suppression and carrier suppression. (See *e.g.*, page 12, lines 17-22). In contrast, Franchville *et al.* are silent with respect to undersampling the modulated transmission signal with respect to the carrier frequency. Rather, Franchville *et al.* teach providing a signal power measurement apparatus for measuring digitally modulated signals that includes a digital measurement circuit operable to use an undersampled digital measurement signal. (See column 3, lines 50-55). Therefore, Franchville *et al.* do not teach the claimed invention.

The Final Office Action dated July 5, 2007 bases the 35 U.S.C. §103(a) rejection of claims 1-5, 14-17 and 22 upon Walczak *et al.* (U.S. Patent 5,193,223) in view of Franchville *et al.* (U.S. Patent 6,041,076) and Ichihara (U.S. Patent 6,587,513). However, it is noted that with respect to the "undersampling" discussed above that the Ichihara (U.S. Patent 6,587,513) reference is not mentioned with respect to the "undersampling" rejection. Therefore, it is respectfully requested that the examiner provide an argument with respect to the Ichihara (U.S. Patent 6,587,513) reference, if in fact that reference was overlooked.

As discussed *supra*, neither Walczak *et al.* nor Franchville *et al.*, alone or when combined, teach or suggest these novel features of applicants' claimed invention. Accordingly, withdrawal of this rejection and allowance of the claim 1 is requested.

Claims 2-5, 14-17 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Walczak *et al.*, as applied to independent claim 1 above, and further in view of Franchville *et al.* It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Neither Walczak *et al.* and Franchville *et al.*, alone or in combination, teach or suggest all limitations recited in the subject claims.

Claims 2-5, 14-17 and 22 depend from independent claim 1. As discussed *supra*, Walczak *et al.* does not teach or suggest all limitations recited in independent claim 1 and Franchville *et al.* fails to overcome the deficiencies of Walczak *et al.* and, therefore, can not teach or suggest all limitations of claims that depend there from. Accordingly, withdrawal of this rejection and allowance of the claims 1-5, 14-17 and 22 is requested.

ii. Neither Walczak et al. nor Franchville et al. nor Ichihara teach the preemphasis in the preemphasis network is adapted to effect the relative phase of the in-phase and quadrature component of the complex-value payload signal relative to each other and/or an amplitude of the in-phase and quadrature input; as recited in amended independent claim 1.

Walczak et al., are silent with respect to a *preemphasis network in the digital processing to set the phase angle and/or amplitude of the in-phase and quadrature input* as recited in claim 1. Moreover, the secondary document Franchville et al. do not cure the aforementioned deficiency with respect to the Walczak et al. reference.

The examiner asserts that Ichihara teaches a predistortion network to set the amplitude of the I and Q signals that are to be provided to the quadrature modulator in order to compensate for distortion. In addition, the Final office Action, dated July 7, 2007 incorrectly asserts that it would have been obvious to one skilled in the art at the time of the invention to provide a predistortion network in the digital processing unit of Walczak et al., for the purpose of reducing distortion as taught by Ichihara. However, Ichihara teaches that predistortion can be used for increasing linearity when using a non-linear amplifier. (See e.g., column 2, lines 7-12 and column 4, lines 45-50). Ichihara, is silent to suppression of unwanted sideband and/or carrier suppression resulting from the use of preemphasis as cited in claim 1. (See e.g., page 4, lines 18-25).

In addition, as set forth in MPEP § 2143.01, motivation to combine or modify references can be found in the art itself, in the general knowledge of those skilled in the art, or in the nature of the problem to be solved. As will be appreciated below, none of these sources provide such motivation to modify the cited art, and upon a close analysis of at least some of these sources, a modification in accordance with the present invention is discouraged. Consequently, such a modification is improper and the claims at issue are nonobvious over the cited art. The cited references themselves provide no teaching that would motivate one of ordinary skill in the art to make modifications thereto in accordance with the present invention.

Accordingly, withdrawal of this rejection and allowance of the claims 1-5, 14-17 and 22 is requested.

III. REJECTION OF CLAIMS 6-7, 10 and 13 UNDER 35 U.S.C. § 103(a)

Claims 6-7, 10 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Walczak *et al.* (U.S. Patent 5,193,223) in view of Franchville *et al.* (U.S. Patent 6,041,076), and in further view of Shyue (U.S. Patent 6,359,936). Reversal of the rejection is respectfully requested for at least the following reasons.

As highlighted above, the claimed invention with respect to independent claim 1, and thus claim 6-7, 10 and 13 which depend from claim 1 are nonobvious over the cited art. Accordingly, a reversal of the rejection is respectfully requested.

IV. REJECTION OF CLAIMS 8-9 and 11-13 UNDER 35 U.S.C. § 103(a)

Claims 8-9 and 11-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Walczak *et al.* (U.S. Patent 5,193,223), Franchville *et al.* (U.S. Patent 6,041,076), and Shyue (U.S. Patent 6,359,936) further in view of Torre *et al.* Reversal of the rejection is respectfully requested for at least the following reasons.

As highlighted above, the claimed invention with respect to independent claim 1, and thus claim 8-9, 11-12 which depend from claim 1 are nonobvious over the cited art. Accordingly, a reversal of the rejection is respectfully requested.

V. REJECTION OF CLAIMS 18-21 UNDER 35 U.S.C. § 103(a)

Claims 18-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Walczak *et al.* (U.S. Patent 5,193,223) in view of Franchville *et al.* (U.S. Patent 6,041,076), and further in view of Torre *et al.* Reversal of the rejection is respectfully requested for at least the following reasons.

As highlighted above, the claimed invention with respect to independent claim 1, and thus claims 18-21 which depend from claim 1 are nonobvious over the cited art. Accordingly, a reversal of the rejection is respectfully requested.

V. CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be in condition for allowance.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should any fees be due as a result of the filing of this response, the Commissioner is hereby authorized to charge the Deposit Account Number 50-1733, EHFP136WOUS.

Respectfully submitted,
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